

Occurrence of several needle pathogens in young stands of scots pine in Latvia

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Importance of understanding the pathogens associated with Scots pine

- Scots pine *Pinus sylvestris* is an abundant and **economically important** tree species in Baltic Sea region.
- **Climate change** plays a critical role in the **spread of invasive pathogens** and posing significant risks to forestry.
- A better understanding of the distribution, impact, and contributing factors of invasive pathogens is essential for developing **effective management strategies**.

Dothistroma Needle Blight (DNB)

- Caused by *Dothistroma sapinea* and *Dothistopma pini*
- Affects over 80 conifer species and is a major global pine disease
- Can cause significant needle loss and reduce tree growth
- Symptoms: Yellow and brown bands on needles, that later turns red



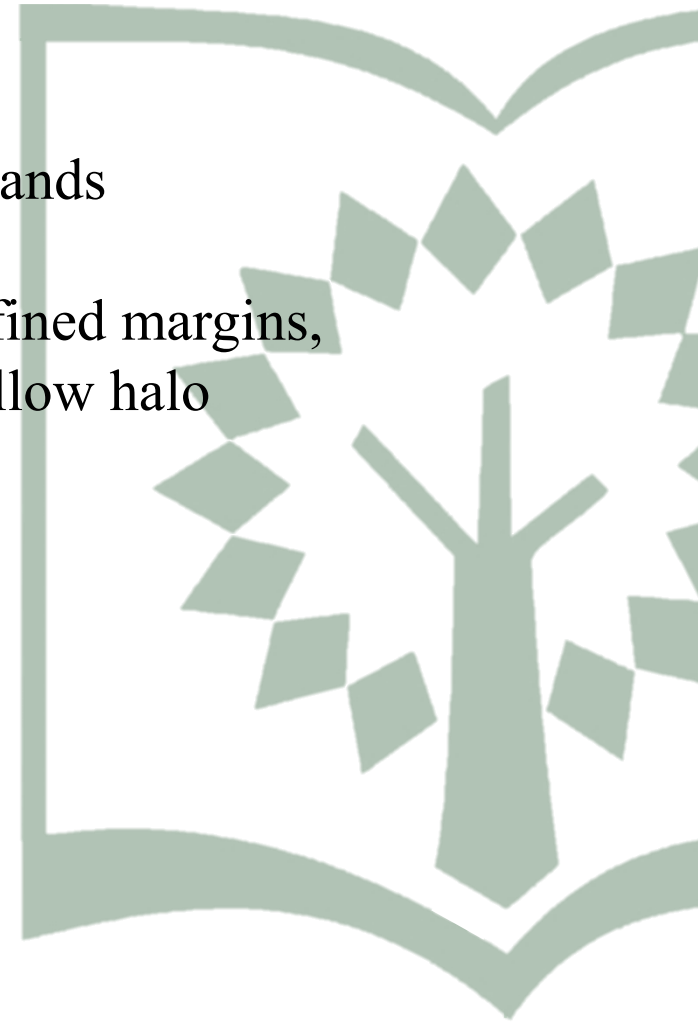
Diplodia sapinea

- Increasingly spreading across the Northern Hemisphere due to climate change
- Has a broad host range, but it primarily affects conifers
- Exists as an endophyte in pine shoots, becoming an opportunistic pathogen when the tree is under stress conditions, such as drought, insect damage, or frost
- Causes collar rot, root disease, seedling damping-off, and blue stain in sapwood.
- Symptoms: needle browning, shoot blight, twig and branch dieback, crown wilt and bark cankers in mature trees

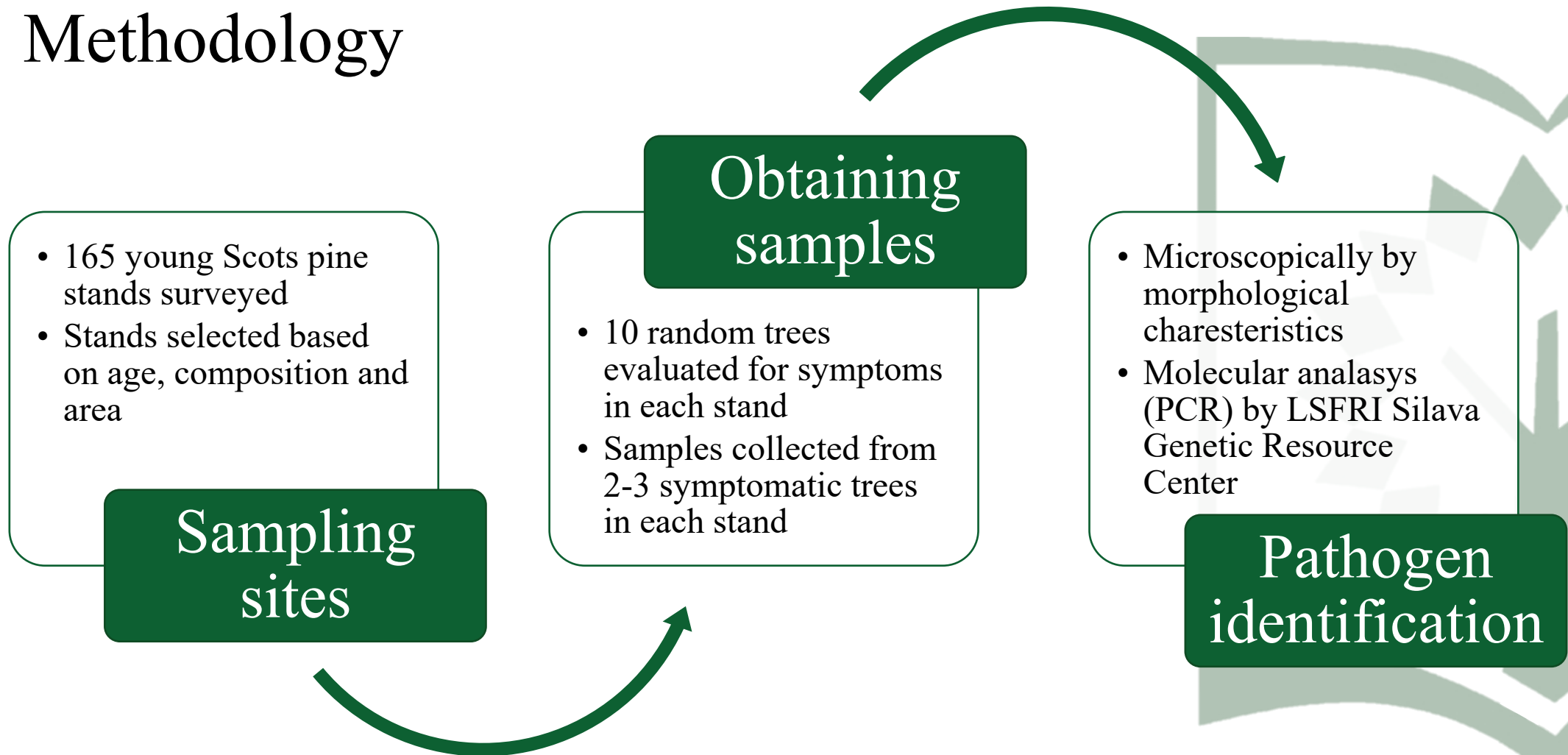


Lecanosticta acicola (BSBN)

- Rapid spread in Europe over the last decades
- Found on ornamental pines but lately also in some *P. sylvestris* stands
- Causes brown-spot needle blight
- Symptoms: appear as small, irregular circular spots with well-defined margins, initially yellow or light gray green, later turning brown with a yellow halo



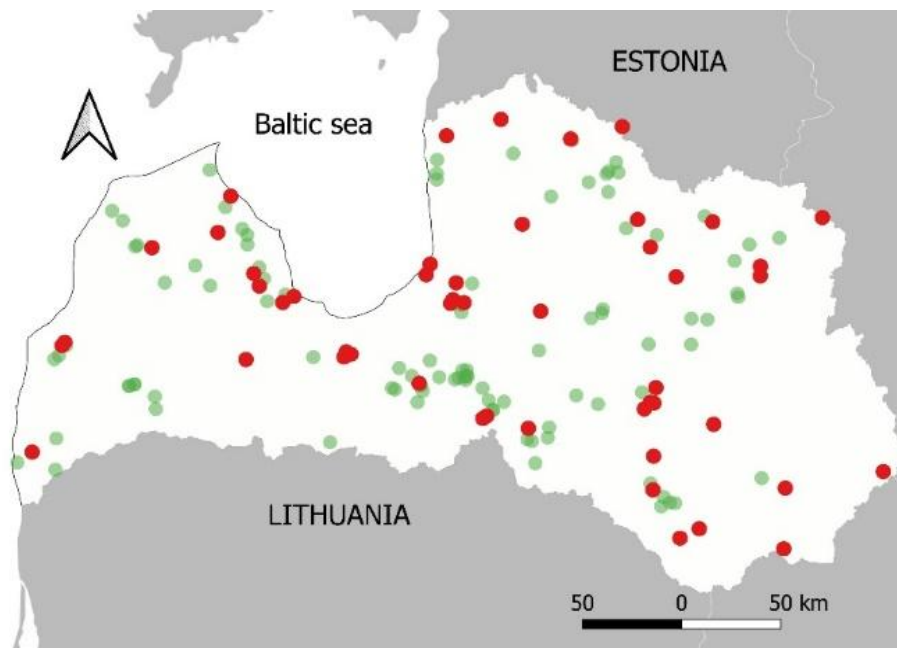
Methodology



Results

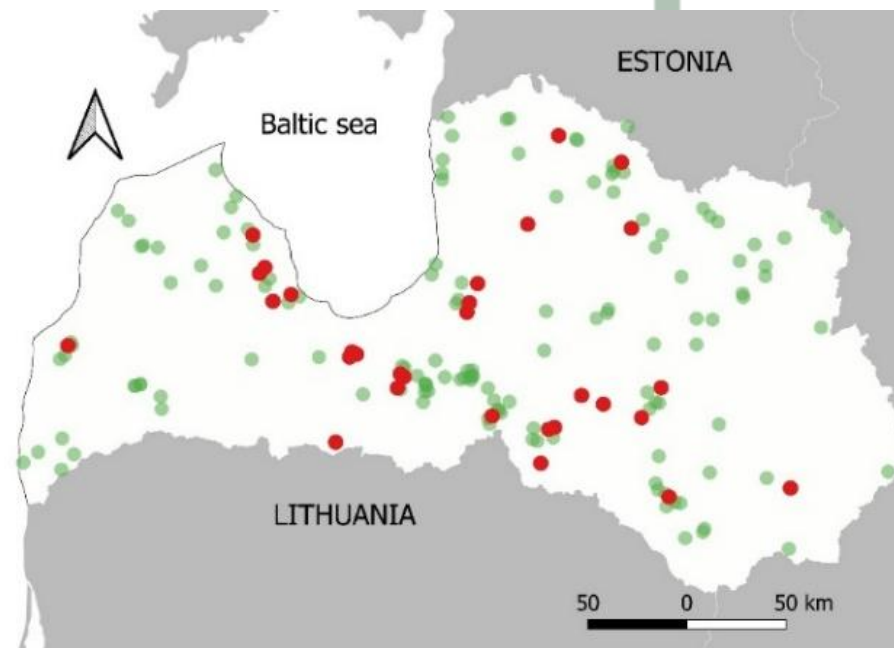
Forest type	Total area, ha	Number of stands	Average age, years	Proportion of healthy trees, %	Proportion of trees with needle damage, %
<i>Hylocomiosa</i>	112.3	44	9.7	45%	55%
<i>Myrtillosa</i>	132.8	53	9.2	39%	61%
<i>Vacciniosa</i>	55.2	23	9.5	29%	71%
<i>Cladinoso-callunosa</i>	1.6	1	8.0	40%	60%
<i>Myrtilloso-sphagnosa</i>	9.7	5	10.4	34%	66%
<i>Vaccinioso-sphagnosa</i>	13.8	8	10.1	16%	84%
<i>Myrtillosa mel.</i>	31.8	14	9.1	51%	49%
<i>Vacciniosa mel.</i>	14.5	9	10.6	27%	73%
<i>Myrtillosa turf. mel.</i>	3.8	3	9.0	20%	80%
<i>Vacciniosa turf. mel.</i>	1.8	1	13.0	0%	100%
<i>Callunosa turf. mel.</i>	1.0	2	6.5	65%	35%
<i>Caricoso-phragmitosa</i>	4.0	2	10.0	35%	65%

Results



Distribution of *Dothistroma septosporum*.

- – forest stands, where the symptoms were caused by the fungus *Dothistroma septosporum*
- – *D. septosporum* was not found



Distribution of *Diplodia sapinea*

- – forest stands, where the symptoms were caused by the fungus *D. sapinea*
- – *D. sapinea* was not found

Results

Dothistroma septosporum

- Detected in 68 stands
- Was the dominant species found in needle samples

Diplodia sapinea

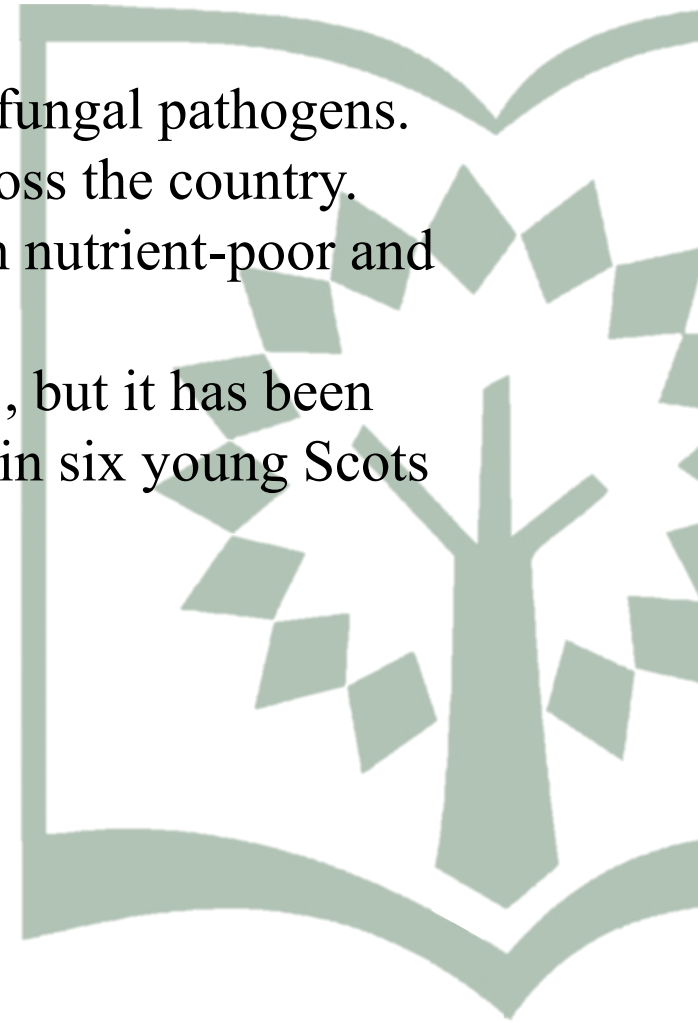
- Detected in 29 stands
- Occurrence influenced by soil type

Lecanosticta acicola

- Was not detected in surveyed stands in 2021
- Found in six stands surveyed in 2024

Conclusion

- Nearly 50% of young pine stands showed symptoms of invasive fungal pathogens.
- *Dothistroma septosporum* was the dominant pathogen spread across the country.
- *Diplodia sapinea* was also frequently encountered, particularly in nutrient-poor and drought-prone sites.
- *Lecanosticta acicola* was not detected in stands surveyed in 2021, but it has been reported in a later study done in 2024 where it has been detected in six young Scots pine stands.



Thank you for your attention!



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